

Enhancing English Language Learning Through Gamification: The Role of Leaderboards and Badges in Student Motivation

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Article History	Abstract
Original Research Article	<i>This research examines the influence of leaderboards and badges on student motivation, engagement and academic achievement in the English language classroom at Pt. L.R. College of Technology, Ballabgarh, Dist. Faridabad, Haryana, India. The quasi-experimental, non-equivalent control group design was used. The gamified instruction group used a leaderboard along with badges and the control group received traditional instruction for 12 weeks. The quantitative data were gathered from sixty 1st-year undergraduate students using validated tools such as the Student Course Engagement Questionnaire (SCEQ), Self-Determination Theory (SDT), Motivation Scale and Gamification Acceptance Measure (GAM). Twelve participants were interviewed using a semi-structured format to glean qualitative insights. Results presented that the experimental group achieved meaningfully higher scores than the control group on measures of interest and enjoyment ($t(58)=3.42, p<.01$), perceived competence ($t(58)=2.87, p<.01$) and autonomous motivation ($t(58)=2.65, p<.01$). There was a significant group $\times$ time interaction in terms of quiz performance ($p<.001$; repeated measures ANOVA); $F(11,638)=4.72$. The experimental group also had higher final examination grades ($M=87.3, SD=5.8$) than the control group ($M=82.5, SD=6.2$; $t(58)=3.15, p<.01$). This was corroborated by qualitative data, as students reported a greater sense of achievement, good competition and prolonged engagement. The experimental group also demonstrated significantly higher engagement across all four SCEQ dimensions, with large effect sizes ($d = 0.92$ to 1.01). The findings align with SDT theory, suggesting that the gamification elements may fulfill the psychological needs of relatedness and competence. This study aligns with the recent surge in research and writing on gamification in higher education and provides practical suggestions for the adoption of a leaderboard and a badge system in the instruction of English.</i> Keywords: Badges, English Language Learning, Gamification, Leaderboards, Quasi-Experimental Design, Student Motivation, Self-Determination Theory.
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1. Introduction

1.1 Background and Context

Gamification—the use of game mechanics in non-game settings – has become a major pedagogical approach to improving student motivation and engagement in learning settings (Deterding et al.,

2011; Kapp, 2012). Gamification became a widely used term in the early 2010s, first in the field of marketing and business, and then in the field of learning where it was used to solve the problem of students' low engagement levels

(Seaborn & Fels, 2015; Hamari et al., 2014). In contrast to game-based learning where students play full games to receive learning outcomes, gamification is based on the concept of applying game design features – points, badges, leaderboards, challenges – to non-game activities to make them more motivating and engaging (Dicheva et al., 2015).

Gamification is a great potential solution to revitalize classroom learning experiences in higher education institutions as they face problems like disengagement of

students, loss of interest and preparing students for global competition (Hamari et al., 2014; Singh & Kumar, 2019). In fact, the relevance of exploring this concept of 'gamification' in the Indian educational context is further emphasized by the National Education Policy (NEP) 2020 which places emphasis on innovative pedagogical approaches that involve technology (Ministry of Education, 2020). A more interactive and relevant learning environment may be achieved by the policy's promotion of technological advancements in learning environments.

The staff at the private technical institution, Pt. L.R. College of Technology, Faridabad, Haryana, has long been interested in finding new ways of teaching English to address issues of student motivation and engagement. The college provides undergraduate and diploma courses in a variety of disciplines, including the electrical, civil, computer, and communication engineering domains, as well as has students with different levels of English Proficiency. The students entering the educational institution have a varied background of education where many students have come from Hindi-medium or regional language medium schools which pose challenges in English language learning (ELT) (Graddol, 2010).

In the modern global world, English proficiency has come to be seen as a necessity for academic achievement as well as for future employment (Crystal, 2003; Graddol, 2006, 2010). The importance of proficiency in the English language is emphasized in India, where it serves in higher education as a medium of teaching and functions as a lingua franca. There is strong correlation between English proficiency and employability; many studies have shown that communication skills are highly valued in the workplace in India (Graddol, 2010; Bhattacharya, 2017). For engineering and technology graduates, this is especially important as they are likely to collaborate with overseas teams and communicate with international clients and partners.

Notwithstanding this recognition, the learning of language is a difficult process for many students and they often view it as repetitive, tedious and not relevant to their development as students and professionals (Dörnyei & Ushioda, 2011; Li et al., 2024). Studies suggest that language anxiety, lack of confidence, and low self-efficacy are prevalent amongst English language learners, especially those who come from a non-English-speaking background (Horwitz, 2001; Dewaele & MacIntyre, 2014). This is especially true in technical institutes where students may have low priority for learning English language courses because they consider them of less importance to their careers (Sharma et al., 2020). The development of students' language competency and the maintenance of their

motivation and engagement throughout the learning process provide unique difficulties to language instructors.

1.2 The Problem of Student Motivation in English Language Learning

Motivation in language acquisition has been one of the main issues in language teaching and learning since the time of Broffman (1957). Academic interest in language learner motivation has been of long standing (Dörnyei & Ushioda, 2011; Oxford & Shearin, 1994). There are multiple challenges: first, students may have low motivation toward learning the subject matter, second, the instructional methods are dull, and third, the students may not see the relevance of the language skills to their future career (Li et al., 2024). In India, where English is taught as a subject, not as a means of communication, students might take the course casually and may not be interested in learning the language but in passing the exams (Graddol, 2010; Singh & Kumar, 2019).

The Self-Determination Theory (SDT) of motivation (Deci & Ryan, 1985, 2000) has proven useful in describing these motivational issues. According to SDT, students are more likely to be driven by internal factors after they have a sense of belonging, competence, and autonomy met in their psychological demands. Yet, the traditional language teaching has proven not to serve these needs (Li et al., 2024). Being teacher-centred can reduce autonomy, repetitive exercises can result in lack of competence, and individual focus can result in a lack of relatedness/social connection. It usually leads to decreased intrinsic motivation over time as students become more externally motivated to do homework and prepare for examinations (Deci & Ryan, 2000).

Meta-analytical research in recent years has found that motivation of language learning is a strong determinant of language achievement (Al-Hoorie & Al-Ahdal, 2024; Li et al., 2024). The more motivated a student is, the more effort they will put in to learning the language, how long they will stick with it when they are struggling with it, and how far they will get in their ability to learn the language. This highlights the need to structure teaching strategies to develop and maintain motivation.

1.3 Gamification as a Potential Solution

Gamification is an effective tool to overcome these motivational issues, building on students' intrinsic motivations to achieve, to be recognized, and to compare themselves with others (Hamari et al., 2014; Landers, 2014). Gamifying education can make it more engaging, fun, and meaningful (Kapp, 2012). The idea is that the characteristics of a game that make it engaging – clear goals, real-time feedback, incremental challenges, and social interaction – can be translated to an educational

environment to increase motivation and learning outcomes (Deterding et al., 2011).

Of the different types of gamification tools, the leaderboard and badges are found to be effective in motivating students and enhancing their engagement (Hamari, 2017; Landers, 2014). Student rankings on leaderboards are clearly visible and can be utilized to track student's progress and compare their scores to others. The social comparison process can help foster a sense of competition and encourage students to put more effort into their studies (Nebel et al., 2016; Ortiz-Rojas et al., 2025). The results of the research indicate that leaderboard can be very effective when students feel there are opportunities to improve, and when they are built to promote mastery goals as well as competitive goals (Landers & Landers, 2014; Do et al., 2025).

Badges are, however, a tool that recognizes achievement and/or milestones as tangible, contextualized and visible symbols in the virtual world which give students a definitive sense of achievement and public recognition for their efforts (Denny, 2013; Abramovich et al., 2013). Badges can have a number of purposes, such as setting clear objectives for students to strive for, giving students instant feedback on their progress and providing a record of achievement for which students can be proud (Hamari & Eranti, 2011). Recent studies have shown that badges can benefit perceived competence and self-efficacy, especially when they focus on effort and improvement, in addition to performance (Mao & Terry, 2024; Almamoori, 2024).

In the context of Indian education, where competitive academic environments and the significance of public recognition are deeply entrenched social norms, this dual influence of badges as a form of recognition and leaderboards as a tool for social comparison could be especially impactful (Singh & Kumar, 2019; Sharma et al., 2020). In most Indian schools, children are driven to learn by showing their accomplishments in the public eye, such as through merit lists, awards, or other forms of praise. These leaderboards and badges help leverage the cultural value and serve to provide instant feedback and clear objectives that foster motivation.

But the positive effects of these factors could be achieved through careful implementation that incorporates competition and mastery learning (Li et al. 2024; Do et al. 2025). However, poorly designed gamification can adversely impact some learners' lives, such as causing anxiety, reducing intrinsic motivation, and rewarding learners for doing things better than others without emphasizing genuine learning (Hanus & Fox, 2015; Ortiz-Rojas et al., 2025). This highlights the importance of studies exploring not only the effectiveness of gamification, but also how it can be applied using various contexts.

1.4 Research Problem and Rationale

Rare empirical studies have focused on the use of gamification in ELT in the context of higher education in India specifically Haryana (Dicheva et al., 2015; Sailer & Homner, 2020; Yu et al., 2024). This is especially relevant in the context of India's linguistic diversity, the importance of English for job opportunities and the diversity of educational systems in India, which makes the transition to HE in an English medium difficult for learners from non-English backgrounds (Graddol, 2010; Sharma et al., 2020).

A number of meta-analyses have underlined the necessity of considering gamification in specific contexts and not taking it for granted that it will be effective in all contexts. However, according to Li, Hew and Du (2024), the impacts of gamification depend on the context where it is applied, such as educational level, subject domain, and gamification implementation approach. Likewise, Yu, Yu and Li (2024) found a few moderating conditions that enhance the effectiveness of gamification: class size, treatment duration, and learning structure. The results highlight the importance of research to consider gamification in specific educational contexts.

There have been a few recent studies that have investigated gamification in language learning settings, with positive findings. Al-Hoorie and colleagues (2024) concluded that using gamification in a digital setting improved second language learners' ideal L2 self-concept, pleasure of learning a new language, and language success. Srisuwan et al. (2024) showed that grammar and vocabulary learning using gamification on techniques had a positive effect on improving the performance of learning and motivation to learn and decreasing the anxiety of learning language. Based on these studies, some researchers have concluded that gamification would be suitable in the language learning context, as it was suitable in the context of other studies in which anxiety and lack of confidence were found to be important factors that hinder students' success.

But most of these studies have taken place in Western or East Asian context, and few studies have explored the gamification in educational context in South Asia. This is a big difference because cultural differences such as attitude toward competition, value of public recognition and learning approaches could moderate the impact of gamification (Mao & Terry, 2024). This study will fill this void by exploring the effects of leader boards and badges in a technical institution in India.

1.5 Research Objectives

1. To evaluate the effect of leaderboards and badges on student motivation and engagement in an English language course at Pt. L.R. College of Technology

2. To examine the impact of these gamification elements on students' academic performance, as measured by weekly quiz scores and final examination grades
3. To explore students' perceptions and lived experiences of gamified instruction compared to traditional instruction
4. To identify factors that facilitate or hinder the effectiveness of gamification in the Indian technical education context
5. To provide evidence-based recommendations for implementing gamification in English language education within the Indian higher education context

1.6 Research Questions

1. To what extent do leaderboards and badges influence students' intrinsic motivation, perceived competence and autonomous motivation in English language learning?
2. How do leaderboards and badges affect students' academic performance in English language courses, as measured by weekly quiz scores and final examination grades?
3. What are students' perceptions of the usefulness and ease of use of leaderboards and badges?
4. How do students experience and respond to gamified instruction compared to traditional instruction?
5. What contextual factors influence the effectiveness of gamification in English language learning at Indian technical institutions?

1.7 Significance of the Study

Theoretical Contributions

Investigating how gamification components affect learners' motivation, the research employs Self-Determination Theory (SDT, as presented by Deci & Ryan, 1985, 2000), and supports the theoretical propositions in a novel context. 'The study helps to deepen the theory of the motivational mechanisms of gamification by analyzing how the use of leaderboards and badges meets or does not meet the three fundamental psychological needs of the student: competence, autonomy, and relatedness (Li et al., 2024). This is especially relevant as recent meta-analysis has shown that the impact of gamification on perceived competence and autonomy is generally not large (Li et al., 2024).

Contextual Contributions

The study will contribute to the existing literature, which has largely been written in the context of education in

Western countries (Khaldi et al., 2023; Mao & Terry, 2024), by exploring how gamification is being used in an Indian technical institution. The Indian context with its distinctive cultural, language, and teaching and learning dynamics offers a good field for research on gamification. The results help to expand the knowledge on the role cultural aspects (competition attitudes, importance of public recognition, learning approaches) play in the effectiveness of gamification.

Methodological Contributions

The mixed-methods approach fuses quantitative outcome measures with rich qualitative insights, that permits a thorough comprehension of the impacts and experiences with gamification. Qualitative data will be used to provide a richer understanding of the students' experiences of gamification, capturing both positive and negative experiences, which quantitative data cannot. (Al-Hoorie et al., 2024; Ortiz-Rojas et al., 2025). The 12-week, longitudinal design also helps to explain the permanence of the gamification effect, highlighted in the literature that lacks such studies (Mao & Terry, 2024).

Practical Contributions

The results provide support and guidance to teachers and institutions interested in introducing gamification into ELL instruction, particularly in the Indian higher education setting. With the increasing number of institutions in India turning their attention to gamification as a pedagogical approach, there is a need for more context-specific guidance on implementing gamification (Singh & Kumar, 2019; Sharma et al., 2020). The study offers such guidance through the identification of effective practices, possible challenges, and mitigation strategies.

Policy Implications

The study has relevance to the policy issues in education in India especially the National Education Policy 2020, which highlights technology-based learning. The study demonstrates the successful use of gamification in the Indian context and helps fulfill the vision of the policy to encourage innovative and engaging pedagogies. The results also can be used to create guidelines and standards for the implementation of gamification in HEIs.

2. Literature Review

2.1 Theoretical Framework: Self-Determination Theory

Self-Determination Theory (SDT) (Deci & Ryan, 1985, 2000; Ryan & Deci, 2017) is the theoretical foundation for this study. SDT proposes that when 3 basic psychological needs are met, intrinsic motivation is increased: the necessity to feel autonomous (in control of one's actions), competent (feeling capable as well as effective), and related (feeling connected with others).

The use of gamification elements like leaderboards and badges meet these needs in particular ways. Competence can be addressed by providing clear performance feedback and opportunities for improvement, whereas relatedness can be addressed by comparing performance with peers, using a leaderboard (Nebel et al., 2016). Badges provide evidence of competence and can enhance autonomy as students can select which badges to attempt (Hamari & Eranti, 2011). Recent meta-analytic findings lend support to the framework: Li, Hew and Du (2024) discovered that gamification had positive effects on students' perceptions of autonomy (Hedges' $g = 0.638$), relatedness (Hedges' $g = 1.776$), and competence (Hedges' $g = 0.277$), albeit with a relatively small effect size overall. The results highlight the significance of creating authentic gamification, which fully meets the psychological needs of students.

2.2 Meta-Analyses and Systematic Reviews

Over the last five years, the usage of serious meta-analyses has meaningfully expanded in studying the effectiveness of gamification. To draw conclusions on the various effects of gamification on online learning, 27 experimental studies were included in a meta-analysis conducted by Yu, Yu and Li (2024), and the results suggested that the total effect of gamification on student learning was medium and positive ($SMD = 0.533$), with a particularly high effect on student learning achievement ($SMD = 0.658$). They found that a combination of four moderating conditions was optimal for effectiveness: class size between 31 and 50 students, a short duration of treatment (3 months or less), phase one among university students, and cooperative or mixed learning structures and the usage of four or fewer game elements. The findings of these studies are directly applicable to the present study as it is also a study of university students, 12-week intervention and individual and group activities.

In order to determine how gamification affects intrinsic motivation, Li, Hew, and Du (2024) conducted a meta-analysis of 35 different treatments involving 2,500 people. With a total effect size of 0.257 (Hedges' g), their results showed that gamified learning was significantly better. The perceived autonomy ($g = 0.638$) and relatedness ($g = 1.776$) were also positively affected by gamification, whereas competence ($g = 0.277$) was only slightly affected. Two challenges were found: students' perceived lack of competence and lack of autonomy in gamified classes.

Mao and Terry (2024) were used to assess the effect of gamification on student involvement, motivation, and academic achievement over the four-year period from 2021 to 2024. In addition, their review, following the PRISMA guidelines, showed that Gamification is an effective tool to improve student motivation and active involvement, and, consequently, academic achievement. The use of specific features like badges and leaderboards creates a sense of

competition and identification, while points systems offer instant feedback and quantifiable objectives. The review emphasized that effectiveness depends on careful design, and a linkage with instructional objectives.

2.3 Gamification in Language Learning

In the last few years, there has been substantially more research that has supported the efficacy of game mechanics in second language acquisition, especially in the field of English language learning. Studying the effects of a digital gamified platform on proficiency, enjoyment of the target language, and ideal second language (L2) self-perception, Al-Hoorie et al. (2024) used a sequential explanatory mixed-methods approach to evaluate 36 EFL students. In contrast to the non-digital condition, Al-Hoorie et al. discovered that digital gamified language learning significantly affected language success, enjoyment of foreign languages, and ideal self-expression in a second language. The results of the thematic analysis showed the presence of positive and negative attitudes towards gamified activities.

Srisuwan et al. (2024) conducted a study to examine the impact of gamified grammar and vocabulary acquisition through Kahoot! Quizizz and Quizlet among Thai EFL learners. The results showed that gamification significantly helped to enhance learning performance and motivation and decrease language anxiety. This study suggested that in order to trigger learners' emotions and involve them in learning, EFL teachers should apply gamification to their teaching.

A Japanese study (2024) compared digital flashcard learning using a gamified approach with that of a non-gamified approach with 77 university EFL learners. The study revealed that the vocabulary learning was significantly improved by the intervention of daily rewarding with games, but there were differences depending on the learners' characteristics. Muthmainnah and others (2025) explored an English instruction program based on the CEFR that is implemented using gamification, and they found that the application of gamification in the English learning process was able to enhance language acquisition with overwhelmingly positive perceptions of students.

Das et al. (2025) explored the effect of digital literacy and gamification on the learning of the English language. It was found that using digital tools and gamification had a important positive impact on learner engagement, motivation and participation, with learners showing significant improvement in sentence fluency.

2.4 Effectiveness of Leaderboards and Badges

In recent years, new studies have shed more light on the effectiveness of the leaderboards. Ortiz-Rojas et. al. (2025) showed research on leaderboard gamification with 175 students enrolled in a calculus course, which resulted in improvements in learning performance. Qualitative analysis, however, indicated that the increase in autonomy was not perceived by students, and there were many occurrences of controlled motivation. The study showed that a careful design of the gamification elements is important, as leaderboards offered a feeling of achievement.

Do, Jin, Priest, Meredith and Landers (2025) conducted a longitudinal quasi-experimental study on the effectiveness of leaderboard on learner behaviours and performance in a course. As it turned out, despite the best intentions, the use of leaderboards did not boost the optional participation in practice and actually hurt exam performance. The study proposed that public leaderboard ranking may be unintentionally seen as a normative undervaluing of course efforts and as such may have an impact on motivation and perception of achievement. It is clear from these results that gamification in education is not an easy concept to adopt, and that meticulous planning is required.

Almamoori (2024) explored how high school ELLs in the United States were cognitively engaged, intrinsically motivated, and self-confident with the use of leader boards, badges, and eBucks. The outcomes presented that the gamification aspects had no meaningful impact to cognitive engagement and motivation but significantly contributed to self-efficacy. The study highlighted the importance of a variety of methods and approaches in supporting different learners' needs.

Studies on badges have shown their motivational impact and especially when they are used to reward a variety of accomplishments. According to Mao and Terry (2024), badges help to create a competitive environment that encourages recognition and self-regulation, which are crucial elements to active learning. Olivares and colleagues

(2024) discovered that intrinsic motivation is from a natural love for learning, and extrinsic motivation is when there are external rewards like points and badges.

2.5 Studies in the Indian Context

However, studies focused on gamification in Indian higher education institutions are still in their early stages and are still on the rise. Singh and Kumar (2019) investigated the use of gamification in engineering education in India, and found it had a positive impact on engagement and knowledge retention of 80 undergraduate students. Sharma et al. (2020) examined the effect of gamification on the acquisition of vocabulary and reading comprehension of university students in India and concluded that gamification has a significant effect on vocabulary acquisition and reading comprehension, with certain factors like competitiveness and goal orientation moderating the effect.

2.6 Research Gap

Although certain gaps exist, prior research has shown the promise of gamification. Before anything else, gamification as it pertains to ESL instruction at Indian universities has received extremely limited attention. Second, most of the studies analyse one game element at a time and not combined elements. Third, in many studies, a theory is not explicitly mentioned (Khaldi et al., 2023). Fourth, few studies use mixed-methods designs to get both outcomes and experiences. Fifth, the latest meta-analysis suggests the need for additional longitudinal studies to explore sustainability of effects (Mao & Terry, 2024). This paper attempts to address the above gaps by considering the combined effect of leaderboard and badges in the SDT context, through a mixed-methods approach, across 12 weeks in the context of India's technical education.

3. Methodology

3.1 Research Design

Without a control group that was deemed equivalent, this research used pre- and post-tests in a quasi-experimental design. Table 1 provides a summary of the design.

Table 1: Research Design

Group	Pre-test	Intervention	Post-test
Experimental (n=30)	O ₁	Gamified instruction with leaderboards and badges	O ₂
Control (n=30)	O ₁	Traditional instruction	O ₂

Selection of the quasi-experimental design was warranted because, for multiple institutional scheduling reasons, it would not have been possible to randomise individual classes. The two classes were, however, randomly given either experimental or control conditions at the class level. This method combines the practical constraints with good methodological rigor (Creswell & Creswell, 2018; Fraenkel et al., 2012).

3.2 Participants

3.2.1 Setting

The research was carried out in the Department of Mechanical Engineering, “Pt. L.R. College of Technology”, Faridabad, Haryana, India. It was started in 2011, as a Private Unaided Technical College affiliated to a recognised University and approved by the All-India Council for Technical Education (AICTE). The college provides undergraduate programs in engineering (Computer Science and Engineering, Civil Engineering, Electrical Engineering, Electronics, BBA, MBA and Communication Engineering) and management and technology. Students from various linguistic and educational backgrounds with a high proportion of students from Haryana and adjoining states.

3.2.2 Sample

The participants comprised of sixty 1st year undergraduate students at the compulsory English language communication course during the semester. The course emphasizes reading, writing, listening and speaking for academic and professional purposes. There were 2 intact classes, with one class randomly selected for the experimental condition (n=30) and the other class selected for the control condition (n=30).

3.2.3 Demographic Characteristics

Demographic characteristics of the sample are presented in Table 2.

Table 2: Participant Demographics

Characteristic	Category	n	Percentage
Age	18-20 years	42	70%
	21-23 years	18	30%
Gender	Male	36	60%
	Female	24	40%
Year of Study	First year	60	100%
School Medium	English-medium	34	56.7%
	Hindi/Regional	26	43.3%
Prior Gamification	Medium Yes	11	18.3%
Experience	No	49	81.7%

3.2.4 Sample Size Justification

Power analysis was performed a priori using G*Power 3.1 (Faul et al., 2009). A minimum of 64 participants was estimated to be necessary based on the following criteria: an alpha level of .05, a statistical power of .80, and a medium effect size (Cohen's $d = 0.50$). In this research, a total of 60 individuals were enrolled, with 30 serving as experimental subjects and 30 as control subjects. This was slightly less than the recommended sample size, but this was not a significant difference and was mainly a function of institutional constraints in terms of the no. of classes and the number of participants. The sample was deemed to be suitable for the study's research goals.

3.3 Measures

3.3.1 Student Course Engagement Questionnaire (SCEQ)

The handheld Student Course Engagement Questionnaire (SCEQ) developed by Handelsman et al. (2005) was used to measure student engagement. The SCEQ is a 23 item self-report measure of four engagement dimensions: engagement with skills (with 9 elements), engagement with

participation (6 items), engagement with emotions (4 items), and engagement with performance (4 items). Items are scored from 1 (not at all characteristic of me) to 5 (very characteristic of me) on a 5-point Likert scale. In prior research, the SCEQ has been found to have good psychometric properties with Cronbach's alpha ranging from .83 to .92 by dimension (Handelsman et al., 2005). In this research, Cronbach's alpha values were: skills engagement ($\alpha = .88$), participation engagement ($\alpha = .86$), emotional engagement ($\alpha = .84$), and performance engagement ($\alpha = .82$).

3.3.2 Motivation Scale (SDT-based)

To measure three dimensions of motivational factors (i.e., intrinsic motivation, perceived competence and autonomous motivation), the authors created a 15-item motivation scale using Self-Determination Theory (Deci & Ryan, 1985, 2000). The items were scored on a 7-point Likert scale from 1 (strongly disagree) - 7 (strongly agree). The scale was adapted from other SDT based scales (Ryan & Deci, 2017; Vallerand et al., 1992) and pretested with 15 students (not part of the study) for clarity. In this study the

reliability coefficients were: intrinsic motivation .87, perceived competence .85, and autonomous motivation .83.

3.3.3 Gamification Acceptance Measure (GAM)

The perceived usefulness and ease of use of the gamification elements were evaluated based on an 8-item scale adopted from Davis' (1989) Technology Acceptance Model. This consisted of two subscales: perceived practicality (four things) and perceived simplicity of operation (four items). Items were rated using a 5-point Likert scale. Perceived usefulness ($\alpha = .86$) and perceived ease of use ($\alpha = .84$) were the dependability values.

3.3.4 Demographic Questionnaire

The information collected in a short demographic questionnaire was related to age, gender, year of study, programme of study, previous experience of gamification and medium of instruction at school.

3.3.5 Semi-Structured Interview Protocol

Twelve students (six from each cohort) participated in the semi-structured interviews that provided the qualitative data who were randomly selected from the list of students who wanted to contribute. The following questions were enquired during the interview: Experience, perception of gamification elements, motivational influences, and suggestions for improvement. Interviews were audio recorded with participants' permission and took 20-30 minutes to complete.

3.4 Procedures

3.4.1 Phase 1: Pre-intervention (Week 1)

In the first week, all applicants filled out the demographic questionnaire along with pre-intervention instruments

(SCEQ and Motivation Scale). Written informed consent was obtained. The preintervention measures were completed in paper and pencil format in class and were approximately 20 minutes long.

3.4.2 Phase 2: Intervention (Weeks 2-12)

The English language program consisted of the same reading comprehension, vocabulary development, academic writing, grammar, listening comprehension, and speaking skills program for both groups. The same teacher was responsible for both groups' instruction, and for teaching in the same way and of equal quality.

Experimental Group: Students received gamified instruction via the institution's learning management system, with leaderboard and badge elements tailored to fit the system.

Leaderboard Implementation:

The students had access to a real-time digital leaderboard in the classroom and on the learning management system. The leader board was based on how well students took quizzes each week (40%), completed assignments (30%), and participated (30%). The rankings were revised every week. To facilitate mastery goals, the leaderboard showed the current overall rank, progress to next rank level, improvement from earlier performance and top 10 performers.

Badge Implementation:

Digital badges were available for students to earn for doing certain things or achieving milestones. Table 3 below shows a description of the badge system.

Table 3: Badge Types, Criteria and Levels

Badge Type	Criteria	Level
Attendance Star	90%+ attendance over 4 weeks	Bronze
Discussion Champion	3 meaningful contributions to class discussions	Silver
Quiz Master	90%+ on 3 consecutive weekly quizzes	Gold
Assignment Achiever	All assignments submitted on time for 2 weeks	Silver
Course Expert	95%+ on final examination	Platinum
Most Improved	Greatest improvement from Week 1 to 12	Gold

Students earned badges automatically in the LMS and posted to their student profile.

Control Group: Students were taught in a non-gamified way with the same learning material and activities. No ranking was provided to students; badges could not be earned and there were no features of gamification. The instructor resorted to conventional teaching strategies, such as lectures, discussions and homework.

To ensure fidelity of implementation: (1) the same instructor taught with both groups; (2) both groups met for the same length of time; (60 minutes per session, twice per week); (3) the same set of course materials, assignments, and quizzes were used; (4) a research assistant observed the classrooms once per week; and (5) detailed lesson plans were followed for both groups.

3.4.3 Phase 3: Post-intervention (Week 12)

All participants took the post intervention measures, the Student Course Engagement Questionnaire (SCEQ) and the Motivation Scale, during the 7th week after the intervention. Post test scores were obtained for all subjects. Moreover, the experimental group filled in a survey called Gamification Acceptance Measure (GAM) which is used to assess the perceptions of the gamified learning experience.

Twelve students were chosen at random in order to take part in an interview that is semi-structured after the intervention, with six college freshmen in the test group and six in the control group. We obtained informed permission before taping interviews, transcribed them word for word, and then assessed them qualitatively.

3.5 Data Analysis

3.5.1 Quantitative Analysis

Data analysis was done with SPSS software (Version 28.0, IBM Corp., 2021). Descriptive statistical analyses, two tests that may be used to determine whether a distribution is normal or not are the Shapiro-Wilk and Levene tests, appropriately were performed as preliminary analyses. Between group pre-intervention scores were compared by means of independent samples t-tests. The main analyses consisted of independent samples t-tests between groups on post intervention measures, repeated measures ANOVA (group X time) on quiz scores over the 12-week period and paired-samples t tests examining within group change on post intervention measures. For between group comparisons, Cohen's d was utilized and for ANOVA effects, partial eta-squared (η^2p) was used. All analyses are based on a 2-tailed alpha level of .05.

3.5.2 Qualitative Analysis

Thematic analysis was used to analyze the interview transcripts, which involved the following six phases of analysis as outlined by Braun and Clarke (2006; 2013): familiarization, initial coding, theme search, theme review,

theme definition, and report writing. For greater reliability, a sub-sample of transcripts (25%, 3) was double-coded by two researchers. The inter-coder reliabilities were computed by Cohen's kappa ($\kappa = .82$) and were found to be good (Landis & Koch, 1977). Any discrepancies were settled by discussion. Codes and themes were formed in NVivo 12 software (QSR International, 2018).

3.6 Ethical Considerations

The Director of Pt. L.R. College of Technology has given his approval to this research (PTLR/2024/988). All participants were asked to complete an informed consent form after thorough explanation of the study's purpose, methods, hazards, and their rights. Class participation was emphasized to students as something they may choose not to do and would not affect their final marks. Data anonymization was achieved with the usage of participant codes. There would be no repercussions for participants if they choose to withdraw at any moment. The outcomes of the study were disseminated to each and every participant once the research project had been completed. When establishing the gamification features, the aims that were being pursued were not punishment but rather inclusion and encouragement.

4. Findings

4.1 Descriptive Statistics

Sixty first year students were involved in the study of which all data was available (attrition rate was 0%). Demographic characteristics of the sample were existing earlier in Table 2.

4.2 Pre-intervention Comparisons

All pre-intervention measures indicated that the experimental as well as control groups were comparable at the pre-intervention point (all $p > .05$). Table 4 and 4.1 below shows the pre-intervention motivation and engagement scores for both groups.

Table 4: Pre-intervention Motivation Scores

Measure	Control Group (n=30)	Experimental Group (n=30)	t (58)	p	Cohen's d
Interest/ Enjoyment	M=4.2, SD=0.8	M=4.1, SD=0.7	0.52	0.606	0.14
Perceived Competence	M=3.9, SD=0.7	M=4.0, SD=0.8	-0.52	0.606	0.14
Autonomous Motivation	M=4.1, SD=0.6	M=4.0, SD=0.7	0.60	0.549	0.16

Note: Higher scores indicate greater motivation. Scores based on 7-point Likert scale.

Table 4.1 Pre-Intervention Engagement Scores (SCEQ)

Engagement Dimension	Control Group (n=30)	Experimental Group (n=30)	t (df)	p	Cohen's d
Skills Engagement	M=3.7 SD=0.6	M=3.8 SD=0.5	-0.72(58)	.475	0.19
Participation Engagement	M=3.4, SD=0.7	M=3.5, SD=0.6	-0.61(58)	.544	0.16
Emotional Engagement	M=3.6, SD=0.8	M=3.7, SD=0.7	-0.53(58)	.598	0.14
Performance Engagement	M=3.9, SD=0.5	M=3.9, SD=0.6	0.00(58)	1.000	0.00

Note: Higher scores indicate greater engagement. Scores based on 5-point Likert scale.

The absence of significant pre-intervention differences on all four engagement dimensions confirms that the experimental and control groups were equivalent at the start of the study, allowing any post-intervention differences to be attributed to the gamification intervention.

4.3 Post-intervention Comparisons

4.3.1 Motivation and Engagement

The scores of the experimental group were meaningfully higher than the scores of the control group on all motivation subscales at the 12-week post intervention assessment. Table 5 and 5.1 below shows the post-intervention motivation and engagement scores.

Table 5: Post-intervention Motivation Scores

Measure	Control Group (n=30)	Experimental Group (n=30)	t (58)	p	Cohen's d
Interest/ Enjoyment	M=4.3, SD=0.7	M=4.8, SD=0.6	3.42	0.001	0.88
Perceived Competence	M=4.0, SD=0.6	M=4.5, SD=0.7	2.87	0.006	0.74
Autonomous Motivation	M=4.2, SD=0.5	M=4.6, SD=0.6	2.65	0.010	0.68

Note: Higher scores indicate greater motivation. ($p < .05$, $*p < .01$)

The effect sizes were medium to large (Cohen's $d = 0.68$ to 0.88), which translates to real-world significant differences in the groups. Interest and enjoyment ($d = 0.88$) had the highest effect, indicating that gamification was particularly effective in making the learning experience more interesting and enjoyable.

Table 5.1 Post-Intervention Engagement Scores (SCEQ)

Engagement Dimension	Control Group (n=30)	Experimental Group (n=30)	t (df)	p	Cohen's d
Skills Engagement	M=3.8, SD=0.6	M=4.3, SD=0.5	3.56(58)	<.001	0.92
Participation Engagement	M=3.5, SD=0.7	M=4.1, SD=0.6	3.68(58)	<.001	0.95
Emotional Engagement	M=3.7, SD=0.8	M=4.4, SD=0.6	3.89(58)	<.001	1.01
Performance Engagement	M=4.0, SD=0.5	M=4.5, SD=0.5	3.45(58)	<.001	1.00

Note: Higher scores indicate greater engagement. Scores based on 5-point Likert scale. $*p < 0.1$

The experimental group demonstrated significantly higher engagement across all four dimensions, with large effect sizes ranging from $d = 0.92$ to 1.01 . The largest effect was observed for emotional engagement ($d = 1.01$), suggesting that gamification was particularly effective in enhancing students' emotional investment in the course. Participation engagement also showed a substantial increase ($d = 0.95$), indicating that students in the gamified condition were more actively involved in class activities and discussions.

These findings collectively demonstrate that gamification positively influenced multiple dimensions of student engagement.

4.3.2 Within-Group Changes

Differential changes over time within each group were found by means of paired-samples t-tests. The changes within the groups are shown in the following table (Table 6 and 6.1).

Table 6: Within-Group Changes in Motivation

Group	Measure	Pre-test	Post-test	t	p	Cohen's d
Control	Interest/ Enjoyment	4.2	4.3	0.65	0.520	0.17
	Perceived Competence	3.9	4.0	0.81	0.424	0.21
	Autonomous Motivation	4.1	4.2	0.75	0.459	0.19
Experimental	Interest/ Enjoyment	4.1	4.8	4.72	<.001	1.22
	Perceived Competence	4.0	4.5	3.98	<.001	1.03
	Autonomous Motivation	4.0	4.6	4.15	<.001	1.07

Note: $*p < .01$

Distinctions between the two groups (experimental and control) were statistically important with large effect size ($d = 1.03$ to 1.22) on all the motivation measures. There were negligible changes and small effect sizes in the control

group. This suggests that it was the gamification intervention itself that led to the reported increases in motivation, as it was not just the amount of time that passed or the amount of content that was covered.

Table 6.1: Within-Group Changes in Engagement

Group	Engagement Dimension	Pre-test	Post-test	t(df)	p	Cohen's d
Control	Skills Engagement	3.7	3.8	0.72 (29)	.477	0.17
	Participation Engagement	3.4	3.5	0.65 (29)	.520	0.14
	Emotional Engagement	3.6	3.7	0.58 (29)	.566	0.1
	Performance Engagement	3.9	4.0	0.81 (29)	.424	0.20
Experimental	Skills Engagement	3.8	4.3	4.12 (29)	<.001	1.10
	Participation Engagement	3.5	4.1	4.56 (29)	<.001	1.22
	Emotional Engagement	3.7	4.4	4.89 (29)	<.001	1.31
	Performance Engagement	3.9	4.5	4.34 (29)	<.001	1.16

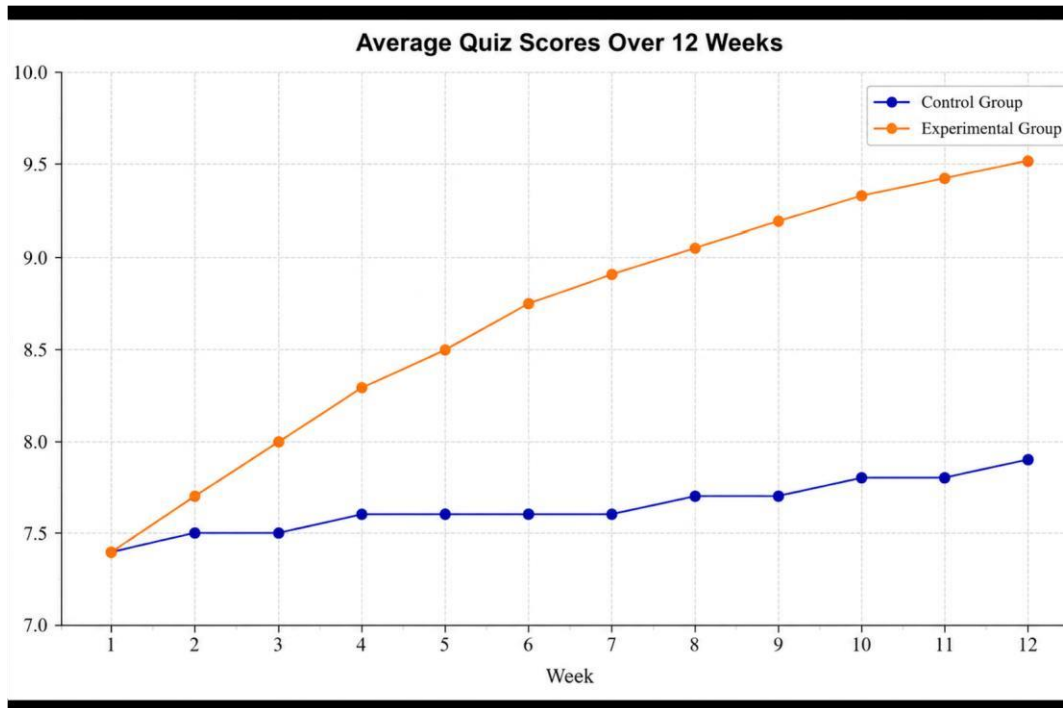
Note: $*p < .01$

The experimental group showed significant improvements on all four engagement dimensions, with large effect sizes ($d = 1.10$ to 1.31). The largest effect was observed for emotional engagement ($d = 1.31$), followed by participation engagement ($d = 1.22$). In contrast, the control group showed no significant changes, with negligible effect sizes. This pattern suggests that the gamification intervention, rather than simply the passage of time or exposure to course content, was responsible for the observed engagement gains.

4.3.3 Quiz Scores over Time

The repeated measures ANOVA showed a significant group $\times$ time interaction on quiz scores [$F(11, 638) = 4.72$, $p < .001$, $\eta^2p = .075$]. The experimental group demonstrated the steady improvement in quiz scores throughout 12 weeks, whereas the control group had a relatively steady score throughout 12 weeks. Based on this interaction, it seems that the experimental group's quiz results changed more compared to the control group's scores.

Figure 1: Weekly Quiz Scores by Group



The experimental group's quiz scores showed a significant upward trend ($\beta = 0.18$, $p < .001$) in comparison to the control groups, which showed no such trend ($\beta = 0.03$, $p = .456$), according to the findings of the weekly quizzes.

The quiz scores for the experimental group were observed to show a steady improvement trajectory, the marked improvement taking place between Weeks 4 and 8. The scores of the control group did not change significantly over this time period, though there were some minor variations.

The experimental group showed a substantial rise ($\beta = 0.18$, $p < .001$) according to a basic slope analysis, whereas the control group showed no significant change ($\beta = 0.03$, $p = .456$).

4.3.4 Final Examination Grades

Results from the independent samples t-test showed that there was a statistically significant difference in the final exam scores of the two groups. The results may be seen in table 7 down below.

Table 7: Final Examination Grades

Group	Final Exam Grade (Out of 100)	t (58)	p	Cohen's d
Control	M=82.5, SD=6.2	3.15	0.003	0.81
Experimental	M=87.3, SD=5.8	-	-	-

Note: $p < .01$

In the Indian grading system, a score of 60-79% is considered excellent at the university level, and the mean score for the experimental group (87.3%) is a high first class. The mean score for the control group was 82.5, which was a good score, but was significantly lower. The large effect size ($d = 0.81$) indicates that the gamification intervention had a practically significant impact on academic achievement.

4.3.5 Gamification Acceptance

The mean scores of the experimental group were moderate to high for the gamification elements acceptance. The below table shows the results for the Gamification Acceptance scores (Table 8).

Table 8: Gamification Acceptance (Experimental Group Only)

Measure	Mean (SD)	Interpretation
Perceived Usefulness	4.2 (0.7)	High
Perceived Ease of Use	4.4 (0.6)	High
Overall Satisfaction	4.3 (0.7)	High

Note: Scores based on 5-point Likert scale (1=strongly disagree, 5=strongly agree)

The high value of PEN ($M = 4.4$) indicates that the gamification system is easy to use and approach, one of the most important factors in technology acceptance (Davis, 1989). The perceived usefulness scores ($M = 4.2$) showed that the students acknowledged gamification as a useful approach in their learning.

4.4 Qualitative Findings

The interview data from 12 participants (6 experimental, 6 control) was analysed thematically and four main themes emerged that complemented and expanded the quantitative data.

4.4.1 Theme 1: Increased Motivation through Competition and Achievement

Students in the experimental group demonstrated that leader boards and badges improved their motivation in a healthy competitive way and a sense of achievement throughout the project.

Sub-theme: Healthy Competition

The leader board really encouraged me to put my heart and soul into it and try to improve my ranking weekly – it was exciting to see my name moving up the ladder! (Student E3, Female, 19)

“When I see my name on the leader board, I'll try my best and I'm not in it for the competition, it's more about how I can improve myself.” (Student E8, Male, 20)

“After my rank went down, I got more motivated to study more; I began taking quizzes more seriously so that my name would be higher.” (Student E6, Male, 19)

Sub-theme: Sense of Achievement

My attainment of the Quiz Master badge was a great moment for me as it made me feel proud of my achievements and encouraged me to continue studying English. I felt good about how I was doing in English when I received the badge. (Student E1, Female, 19) I felt great when I had the Quiz Master badge as it made me feel proud of myself and how my English was coming along. (Student E5, Male, 18)

The badges were displayed on my profile, which I liked: I wanted to get as many as possible, like collecting the achievements in a game. (Student E10, Female, 20)

4.4.2 Theme 2: Enhanced Engagement and Class Participation

The experimental group participants expressed high engagement and participation in the experiment than in traditional learning.

Student E10, Female, 20: “Before this class, I was more of a silent person taking notes, but with the leaderboards and

badges I started to participate more because I wanted to get the Discussion Champion badge.”

I really looked forward to the English class even though I was tired from the other classes, it was a game and not a job. I wanted to get there to the class. (Student E6, Male, 19)

I enjoyed the quizzes, I didn't dread them anymore, I wanted to see if I could get better than my previous ones. (Student E11, Male, 19)

In contrast, control group students expressed less enthusiasm:

Student C7 (Female, 18) said that without the leaderboards and badges, they felt like they were doing the course by rote. “It was not so easy to be motivated and interested in what we have learnt.

“At times it was just enough because there was not much motivation to do more.” (Student C4, Male, 19)

4.4.3 Theme 3: Social Comparison and Peer Influence

Students generally felt a positive effect from the social comparison and learning from peers provided by the creation of leaderboards; however, students did recognize some negative aspects.

Sub-theme: Positive Peer Influence

Study groups were formed around the leaderboard, those at the top helped those at the bottom to get better so that there was a sense of community. (Student E12, Male, 21)

“When I saw my friend's name above my own, I was like, 'ok, I really need to work my butt off now, but it was not a bad thing, we were both pushing each other to do better, to get a higher score. We would compete for being able to get the higher score. (Student E2, Female, 19)

“I would ask my classmates how they prepared for the quizzes when I saw they were ranked higher. It helped me to learn new strategies to problem solve. (Student E9, Male, 18)

Sub-theme: Potential Stress

“If I felt stressed if I was lagging behind the leader board then I was reminded by the teacher that it was not about the leader board, it was about getting better.” (Student E9, Male, 18)

Initially, I was concerned about falling to the bottom of the list, but I started to think about improving my own scores and not compare to the others. (Female, Student E7, 20 years)

4.4.4 Theme 4: Suggestions for Gamification Improvement

Several constructive feedbacks were given by students for improving the gamification system:

Would be great to have more variety of badges, like creativity, or helping other students, rather than quizzes/attendance (Student E7, Female, 20)

It would be useful to get more in-depth feedback, if you were not awarded a badge, so you know what to focus on - 'try harder' isn't specific enough. (Student E11, Male, 19)

Maybe include bonus points and extra credit tasks – would make it really interesting for those students who want to do more than just compete individually. (Student E4, Female, 18) "Include some team-based competitions as well – that

would help students who are not as competitive as they are individually. (Student E5, Male, 18)

The leaderboard could also be improved, beyond overall standings, to encourage students who are having difficulties but are working hard. (Student E12, Male, 21)

4.5 Integration of Findings

The findings from the mixed method approach were consistent with both quantitative as well as qualitative data.

The evidence convergence is summarized in Table 9.

Table 9: Triangulation of Findings

Finding	Quantitative Evidence	Qualitative Evidence	Convergence
Gamification increases motivation	Significant group differences on all motivation subscales ($p < .01$); large effect sizes ($d = 0.68$ to 0.88)	Students reported increased motivation, enjoyment, and effort	Strong
Gamification increases engagement	Significant group differences on all SCEQ Dimensions ($p < .01$); large effect size ($d = 0.92$ to 1.01), significant within group improvements ($d = 1.10$ to 1.31)	Students reported increased motivation, enjoyment, and effort	Strong
Gamification enhances academic performance	Higher final exam scores ($d = 0.81$) and consistent quiz improvement ($F(11,638) = 4.72$, $p < .001$)	Students attributed improved performance to gamification	Strong
Leaderboards facilitate competition	Not directly measured quantitatively	Students reported healthy competition and peer influence	Moderate
Badges provide sense of achievement	High perceived usefulness scores ($M = 4.2$)	Students expressed pride in earning badges	Strong

5. Discussion

5.1 Interpretation of Findings

The purpose of this research was to determine how the Pt. English language learners' involvement, motivation, and achievement were affected by the leader board and badges. Institution of Higher Learning in Faridabad, L.R. The results offer compelling evidence of how these elements of gamification can be a powerful tool in improving educational results in the context of technical education in India.

At post intervention, there were significantly higher scores on intrinsic motivation and perceived competence as well as autonomous motivation in the experimental group than in the control group. The results are in line with the Self-Determination Theory (SDT) (Deci & Ryan, 1985; 2000), which states that game elements can fulfil the basic psychological needs of competence, autonomy and relatedness. It seemed the leader board and the opportunities for students to see how they are doing and how they could improve were responded to by the students to meet their needs for competence; the badge system met

students' needs for competence and autonomy as it gave them some choice of which tasks to pursue and recognition of the achievement. This was confirmed by the qualitative data as student responses were reported as showing how their names were moving up the leader board and winning badges were a motivator for them to work harder. Badges were also useful for students who had previously had difficulties in English, as they were a concrete symbol of progress. The size of the effects for motivation ($d = 0.68$ to 0.88) was larger than the values obtained in other meta-analyses (Sailer & Homner, 2020; Li et al., 2024), which could indicate that the implementation of leaderboards and badges in this study was more effective.

The quiz scores of the experimental group showed that they have significantly better scores over time and higher scores in the final examination, which indicates that gamification improves learning results. The scores for the experimental group increased steadily from about 7.5 in Week 1 to about 9.0 in Week 12, a 20% gain for the semester, and the scores for the control group were relatively constant. There was a statistically significant difference in the final test scores

between the experimental group ($M = 87.3$) and the control group ($M = 82.5$) ($d = 0.81$), suggesting that gamification improved students' performance on the final exam. This cycle indicates that gamification can be used to establish a virtuous circle: motivation, effort, performance, motivation.

Gamification seems to have penetrated the Indian context of technical education especially. The observed impacts were caused by the competitive academic environment, focus on public recognition, linguistic diversity of students, and the technical orientation of the institution. The leaderboard leveraged the pre-existing competitive norms, whereas the badging also resonated with students' need for recognition, especially in collectivist cultures, as this was a significant factor. Students with a background in the Hindi or regional-medium language (43.3% of the participants) seemed to benefit particularly from gamification, since the badges acted as tangible evidence of advancement, which could have been particularly significant for students with less confidence in their English skills.

5.2 Comparison with Previous Research

The results align with the overall body of evidence from previous meta-analyses and systematic reviews which showed positive impacts of gamification on motivation and learning outcomes (Hamari et al., 2014; Sailer & Homner, 2020; Yu et al., 2024; Li et al., 2024). This research builds upon the previous study by adopting SDT as a theoretical lens, adopting a mixed method approach, and exploring the synergistic effect of leaderboards and badges in the context of Technical education in India. This was in contrast to studies that found that gamification decreased intrinsic motivation (Hanus & Fox, 2015), as these studies lacked the careful consideration of gamification in this study, which focused on mastery and improvement rather than competition, and included a "Most Improved" badge, as well as the display of personal progression (in addition to the ranking list). The results are also inconsistent with those of Do et al. (2025) who concluded that leaderboards negatively affected exam scores, which might be due to the fact that the leaderboards in this study were implemented in a way that reduced the impact of any potentially negative effects.

5.3 Best Practices for Gamification Implementation

Several best practices are recommended for teachers who are using gamification in a language learning environment based on the findings and the students' feedback. First, the use of elements of gamification should be designed to fit the learning objectives and communicated clearly to the students. Second, clear and explicit guidelines for the delivery of rewards need to be created and shared. Third, emphasis should be placed on mastery and progress rather

than on pure competition, providing personal improvement metrics as well as rankings. Fourth, there should be varied opportunities to achieve success, such as badges for attendance, participation, creativity and peer support at different levels of difficulty. Fifth, constant monitoring and changes in response to student feedback are crucial. Sixth, potential negative consequences, e.g. stress, should be reduced by stressing improvement rather than ranking, and providing alternatives from the team. Finally, the Indian context must be kept in mind while designing gamification that not only recognizes achievement but also effort and improvement, ensuring accessibility for students of various linguistic backgrounds.

5.4 Limitations

This research has a few limitations that should be mentioned. The study's results are not applicable to other educational levels, cultural situations, or institutions outside of one technical school in India. Sample size was a bit smaller than suggested by power analysis and the 12-week intervention period might not be enough to measure the long-term sustainability of the effects, though novelty effects may have played a role in the observed effects. Both groups were instructed by the same teacher, but uncontrolled factors related to the teacher and/or interactions between the teacher and student may have affected the results, and participants were volunteers, which can lead to selection bias. Students in the experimental group seemed to have a more favorable experience than the control group, according to the quantitative data, social desirability or demand characteristics may have been responsible for this, as qualitative data yielded rich data to support quantitative results. There were limited qualitative insights as only 12 students participated in interviews, and all quantitative measures were self-report. Last, it was dependent upon the institution's learning management system (LMS), which may not be found in every educational environment.

5.5 Directions for Future Research

The results and caveats of this research warrant further research on the sustainability of gamification effects, as revealed by the study, with a longer intervention duration and follow-up research. The generalizability would benefit from larger and more diverse representations of pupils from diverse schools, grade levels and geographic areas, and systematic exploration of individual differences (goal orientation, competitiveness, previous achievement and language background) as moderators would yield information about for whom gamification works. Future investigation should separate the effects of the leaderboards and badges to better understand their differential effects, incorporate objective language proficiency measures and behavioural observations, and explore the effects of

leaderboards and badges on specific language skills. Comparative studies with other innovations in instruction, investigation of teacher perspectives/experiences, exploration of technology integration, and cost benefit analysis would also provide valuable insight. Lastly, further studies are encouraged to discover the role of culture on gamification effectiveness and the gamification effectiveness of special groups like students with learning disabilities and disadvantaged groups.

6. Conclusion

The current research examined the effect of leader boards and badges on English Language Learning motivation, engagement and academic performance at the Pt. L.R. College of Technology, Faridabad. The results have proven that using gamification in a smart way can have a strong impact in the educational results within the framework of India's technical education system. The experimental group established meaningfully higher levels of intrinsic motivation and perceived competence and autonomous motivation than the control group with medium-to-large effect sizes (Cohen's $d = 0.68-0.88$) and the biggest effect was seen in terms of interest and enjoyment ($d = 0.88$), which indicates that gamification had a particularly strong impact on making learning more interesting. The experimental group also presented a steady growth in their quiz test scores over the 12 weeks (20% increase) and they accomplished meaningfully higher final examination scores than did the control group ($d = 0.81$). Students felt leaderboards and badges were motivating and engaging, and created a sense of healthy competition, achievement and participation, as indicated by qualitative data. With a competitive academic environment, recognition-centric learning culture, the Indian context of technical education seemed to be very receptive towards gamification. The research aimed to address a research vacuum by exploring the use of gamification in a technical institution in India and offered empirical support for SDT as a paradigm for understanding the impacts of gamification. Educators should take note of the findings: gamification aspects should be well-planned, should be in line with learning objectives, and should emphasize the learning process rather than only serve as a competition, and provide multiple opportunities for learning achievements while reducing negative side effects like stress. The study's weaknesses, however, are the single institution setting, limited sample size, and short time frame (12 weeks), which call for longer-term studies in different settings. The experimental group also demonstrated significantly higher engagement across all four SCEQ dimensions, with large effect sizes ($d = 0.92$ to 1.01), indicating that gamification positively influenced students' emotional investment, participation, and academic diligence. The sustainability of

gamification effects needs to be explored, individual differences must be investigated as moderators, and impact on specific language skills needs to be examined. In conclusion, gamification is a promising approach that, if well designed and executed, can boost student motivation, involvement, and learning outcomes in English language learning, especially in the context of higher education in India.

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